

180W  
24V Booster



## ITP-G802TM-8PH24

10x 100/1000Base-T with 8x PoE<sup>+</sup> Managed Ethernet Switch

## ITP-G802SM-8PH24

8x 100/1000Base-T + 2x 100/1000Base-X SFP with 8x PoE<sup>+</sup> Managed Ethernet Switch



These models are managed industrial grade Gigabit PoE (Power over Ethernet) switches that provide 8x GbE UTP + 2x GbE SFP or 10x GbE UTP with 8x PoE Ports, that equipped with PoE features enable power and data to be transferred via a single cable, thereby considerably reducing cabling and electrical wiring expenses. These switches also provide a variety of functions to manage PoE operation including PoE device auto-checking, auto reset, and PoE power weekly scheduling. Other advanced Ethernet functions are supported and include STP/RSTP/MSTP/ ITU-T G.8032 ERPS and multiple μ-Ring for redundant cabling, layer 2 Ethernet IGMP, VLAN, QoS, Security, IPv6, bandwidth control, port mirroring, cable diagnostic and Green Ethernet.

Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for the harshest environments. Specifically, These switches use M12 connectors to ensure water tight, robust connections and to guarantee reliable connections against environmental disturbances, such as vibration and shock. Besides, these models are compliant with EN50155, covering power input voltage, surge, EFT, ESD, vibration, shock, thus making the switches suitable for industrial applications, such as vehicle, rolling stock, ship, vessel.

These models are IP67 rated to protect against dust and water submersion, they are particularly used in environments with extreme temperature, high humidity, oil, dust and in outdoor environments requiring water-proof applications such as IP surveillance, city security. They can also work with CTC Union's platform SmartView™ to provide convenient, real-time and centralized device management.

### Features

- 8x 10/100/1000Base-T M12 UTP and 2x 100/1000Base-X SFP Fiber with 8x PoE+ (Total 10 ports) (ITP-G802SM-8PH24)
- 10x 10/100/1000Base-T M12 UTP with 8x PoE+ (Total 10 ports) (ITP-G802TM-8PH24)
- M12 and M23 connector against vibration and shock, X-code or A-code M12 for Gigabit port optional
- IP67 grade housing for against water, dust, and oil (Figure 4)
- 24/48VDC redundant dual input power, and built-in power booster design upto 55 VDC for PoE output (Figure 2)
- Regulated PoE output voltage (55VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meters (Figure 2)
- Provides 8-port IEEE 802.3af / 802.3at PoE output (30W per Port)
- Maximum PoE output power budget 180W
- Advanced PoE Management, management, PoE PD failure, auto checking and auto reset, PoE configuration for power planning, weekly scheduling
- EN60950-1, CE, FCC, Rail Traffic EN50155, EN45545-2, EN50121-4 certified
- Heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Cable diagnostics, identifies opens/shorts from 7 to 100 meters
- Supports Green Ethernet IEEE 802.3az EEE (Energy Efficient Ethernet) management to optimize the power consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Protection Ring (EPR) for redundant cabling
- Provides up to 5 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses. (Please see CTC Union's μ-Ring white paper for more details)
- μ-Ring for Redundant Cabling, recovery time<10ms in 250 maximum devices
- Build-in 2 bypass GbE UTP ports to avoid one or more nodes power fail in a ring or bus structure to collapse the network (ITP-G802TM-8PH24)
- DHCP Server/ Client/ Relay/ Relay option 82/ Snooping
- Support TTDP for train application
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE 802.1q VLAN, MAC based VLAN, IP subnet based VLAN, Protocol based VLAN, VLAN translation, GVRP, MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation, Static Link Aggregation
- IGMP snooping V1/V2/V3, IGMP Filtering/ Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- Security : Port based and MAC based IEEE 802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP, SNTP, IEEE 802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management\*

\*Please see Chapter 1- **Software Management** for more details

## Specifications

<b>Standard</b>	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.1d	STP (Spanning Tree Protocol)
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)
	IEEE 802.1Q	Virtual LANs (VLAN)
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication
	IEEE802.3ac	Max frame size extended to 1522Bytes
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
	IEEE 802.3x	Flow control for Full Duplex
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	IEEE 802.1ad	Stacked VLANs, Q-in-Q
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)
	IEEE 802.3az	EEE (Energy Efficient Ethernet)
	<b>VLAN ID</b>	4094 IEEE802.1Q VLAN VID
<b>Switch Architecture</b>	Back-plane (Switching Fabric): 20Gbps (Full wire-speed)	
<b>Data Processing</b>	Store and Forward	
<b>Flow Control</b>	IEEE 802.3x for full duplex mode Back pressure for half duplex mode	
<b>PoE RJ-45 Pin Assignment</b>	8x M12 (8-Pin A-code or X-code Female) ports support IEEE 802.3af / IEEE 802.3at End-Span, Alternative A mode.	
<b>Network Connector</b>	10x M12 (8-Pin, Female, A-Code or X-code) 10/100/1000Base-T UTP (ITP-G802TM-8PH24) 8x M12(8-Pin, Female, A-Code or X-code) 10/100/1000Base-T + 2x 100/1000Base-X SFP (ITP-G802SM-8PH24) UTP port provide auto negotiation speed, Auto MDI/MDI-X, Full/Half duplex function Build-in 2x bypass GbE UTP ports (ITP-G802TM-8PH24) 2x Water-proof cable connector 2x 100/1000Base-X SFP slot, with DDMI (ITP-G802SM-8PH24)	
<b>Console</b>	RS-232 (5-pin A-Code M12 male)	
<b>Network Cable</b>	UTP/STP above Cat. 5e cable EIA/TIA-568 100-ohm (100m)	
<b>Protocols</b>	CSMA/CD	
<b>Reverse Polarity Protection</b>	Supported	
<b>Overload Current Protection</b>	Supported	
<b>CPU Watch Dog</b>	Supported	
<b>LED</b>	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber) UTP port: 10/100 Link/Active (Green) 1000 Link/Active (Amber) SFP Fiber Per port: Link/Active (Green) PoE Port LED 1 LED /per Port : • PoE Output Power On : ON (Green) • PoE Fault (Over Load, Short Circuit, Port failed at Startup) : Flash 1times /sec (Green)	
<b>Jumbo Frame</b>	9.6KB	
<b>MAC Address Table</b>	8K	

## Software Specifications

<b>Topology</b>		
<b>VLAN</b>	IEEE 802.1q VLAN, up to 4094	IEEE 802.1Q VLAN VID
	IEEE 802.1q VLAN, up to	4094 Groups
	IEEE 802.1ad Q-in-Q	
	MAC-based VLAN, up to	256 entries
	IP Subnet-based VLAN, up to	128 entries
	Protocol-based VLAN(Ethernet, SNAP, LLC), up to	128 entries
	VLAN Translation, up to	256 entries
	GVRP (GARP VLAN Registration Protocol)	
	MVR ( Multicast VLAN Registration )	
<b>Link Aggregation (Port Trunk)</b>	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group	
	Dynamic (IEEE 802.3ad LACP), up to 5 trunk group	
<b>Spanning Tree</b>	IEEE802.1d STP, IEEE802.1w RSTP, IEEE802.1s MSTP	

<b>Memory Buffer</b>	512K Bytes for packet buffer				
<b>PoE Standard</b>	IEEE802.3af, IEEE802.3at				
<b>PoE Power Output</b>	Maximum PoE output power budget 180W (30W/per port) Regulated PoE output voltage at 55VDC (Figure 2)				
<b>Power Supply</b>	Provides 1x M23 (5-Pin, male) for redundant dual DC 24/48V (20~57VDC) input power Built-in very high efficiency booster(94~97%) to rise up 55 VDC for PoE output Regulated PoE output voltage (55VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure 2)				
<b>Power Consumption</b>	ITP-G802TM-8PH24				
	<b>Input Voltage</b>	<b>Total Power Consumption</b>	<b>Device Power Consumption</b>	<b>PoE Budget</b>	<b>Boost Efficiency</b>
	24 VDC	200.4W	11.7W	180W	95.6%
	48 VDC	200.2W	12.5W	180W	95.9%
	ITP-G802SM-8PH24				
	<b>Input Voltage</b>	<b>Total Power Consumption</b>	<b>Device Power Consumption</b>	<b>PoE Budget</b>	<b>Boost Efficiency</b>
	24 VDC	198.5W	9.8W	180W	95.30%
	48 VDC	199.2W	11.5W	180W	95.80%
<b>Warning Message</b>	System Syslog, SMTP/ e-mail event message, alarm relay				
<b>Alarm</b>	5-pin A-code M12 male				
<b>Relay Contact</b>	Relay outputs with current carrying capacity of 1 A@24VDC				
<b>Operating Temperature</b>	-40 ~ 75°C				
<b>Operating Humidity</b>	5% to 95% (Non-condensing)				
<b>Storage Temperature</b>	-40 ~ 85°C				
<b>Housing</b>	Rugged Metal, Fanless , IP67 grade housing for against water, dust, and oil (Figure 4)				
<b>Dimensions</b>	69 x 240 x 168mm (D x W x H)				
<b>Weight</b>	2.170kg (ITP-G802SM-8PH24) 2.15kg (ITP-G802TM-8PH24)				
<b>Installation Mounting</b>	Wall mounting, or DIN Rail mounting (Optional)				
<b>MTBF</b>	371,857 Hours (ITP-G802SM-8PH24) 362,429 Hours (ITP-G802TM-8PH24) (MIL-HDBK-217)				
<b>Warranty</b>	5 years				
<b>Certification</b>					
<b>EMC</b>	CE				
<b>EMI (Electromagnetic Interference)</b>	FCC Part 15 Subpart B Class A, CE				
<b>Railway Traffic</b>	EN50155, EN50121-4				
<b>Fire protection of railway vehicles</b>	EN45545-2				
<b>Immunity for Heavy Industrial Environment</b>	EN61000-6-2				
<b>Emission for Heavy Industrial Environment</b>	EN61000-6-4				
<b>EMS (Electromagnetic Susceptibility) Protection Level</b>	EN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-5 (Surge) Level 3, Criteria B EN61000-4-6 (CS) Level 3, Criteria A EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A				
<b>Safety</b>	EN60950-1				
<b>Shock</b>	IEC-61373				
<b>Freefall</b>	IEC 60068-2-32				
<b>Vibration</b>	IEC-61373				
<b>Multiple μ-Ring</b>	up to 5 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. (Please see CTC μ-Ring white paper for more details and more topology application)				
<b>Loop Protection</b>	Supported				
<b>ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)</b>	Recovery time <50ms				
<b>QoS Feature</b>	Single Ring, Sub-Ring, Multiple ring topology network				
<b>Class of Service</b>	IEEE802.1p 8 active priorities queues for per port				

5 EN50155 PoE Switch ITP-G802TM-8PH24 & ITP-G802SM-8PH24

<b>Traffic Classification</b>	IEEE802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
<b>Bandwidth Control for Ingress</b>	Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame
<b>Bandwidth Control for Egress</b>	Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit / Per queue / Per port shaper
<b>DiffServ (RF 2474) Remarking</b>	
<b>Storm Control</b>	for Unicast, Broadcast, Multicast
<b>IP Multicasting Feature</b>	
<b>IGMP / MLD Snooping</b>	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2 Port Filtering Profile, Throttling
<b>IGMP / MLD Snooping</b>	Fast Leave Maximum Multicast Group : up to 1022 entries Query / Static Router Port
<b>Security Features</b>	
<b>IEEE 802.1X</b>	Port-Based, MAC-Based
<b>ACL</b>	Number of rules : up to 256 entries for L2 / L3 / L4 L2: Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
<b>RADIUS authentication &amp; accounting</b>	
<b>TACACS+ authentication &amp; accounting, TACACS+ 3.0</b>	
<b>HTTPS, HTTP</b>	Supported
<b>SSL / SSH v2</b>	Supported
<b>User Name Password Authentication</b>	Local Authentication Remote Authentication (via RADIUS / TACACS+)
<b>Management Interface Access Filtering</b>	Web, Telnet / SSH , CLI RS-232 console
<b>Management Features</b>	
<b>CLI</b>	Cisco® like CLI
<b>Web Based Management</b>	
<b>Telnet</b>	Server
<b>SNMP</b>	V1, V2c, V3
<b>SW &amp; Configuration Upgrade</b>	TFTP, HTTP Redundant firmware in case of upgrade failure
<b>RMON II</b>	RMON I (1, 2, 3, 9 group), RMON II
<b>MIB II</b>	RFC 1213
<b>UPnP</b>	Supported

<b>DHCP</b>	Server, Client, Relay, Relay option 82 , Snooping
<b>TTDP</b>	Supported (Train Topology Discovery Protocol)
<b>IP Source Guard</b>	Supported
<b>Port Mirroring</b>	Supported Syslog server (RFC3164) (Support 1 server )
<b>Warning Message</b>	System syslog, e-mail, alarm relay
<b>DNS</b>	Client, Proxy
<b>IEEE1588 PTP V2</b>	Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
<b>NTP, SNTP</b>	Client
<b>LLDP (IEEE 802.1ab)</b>	Link Layer Discovery Protocol LLDP-MED
<b>IPv6 Features</b>	
<b>IPv6 Management</b>	Telnet Server/ICMP v6
<b>SNMP over IPv6</b>	Supported
<b>HTTP over IPv6</b>	Supported
<b>SSH over IPv6</b>	Supported
<b>IPv6 Telnet</b>	Supported
<b>IPv6 NTP, SNTP</b>	Client
<b>IPv6 TFTP</b>	Supported
<b>IPv6 QoS</b>	Supported
<b>IPv6 ACL</b>	Number of rules: up to 256 entries for L2 / L3 / L4 L2: Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
<b>Others Features</b>	
<b>Green Ethernet</b>	Supports IEEE802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption Determine the cable length and lowering the power for ports with short cables Lower the power for a port when there is no link LED Power Management :Adjustment LEDs intensity
<b>Cable Diagnostic</b>	Measuring UTP cable OK or broken point distance
<b>Advanced PoE Management</b>	PoE PD Failure Auto Checking, and Auto reset when PD fail PoE Scheduling ( On/Off schedule weekly) PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Total PoE Power budge (maximum 180W) limitation Power feeding priority

## Application

Figure 1 : ITP Series in Onboard Train Application

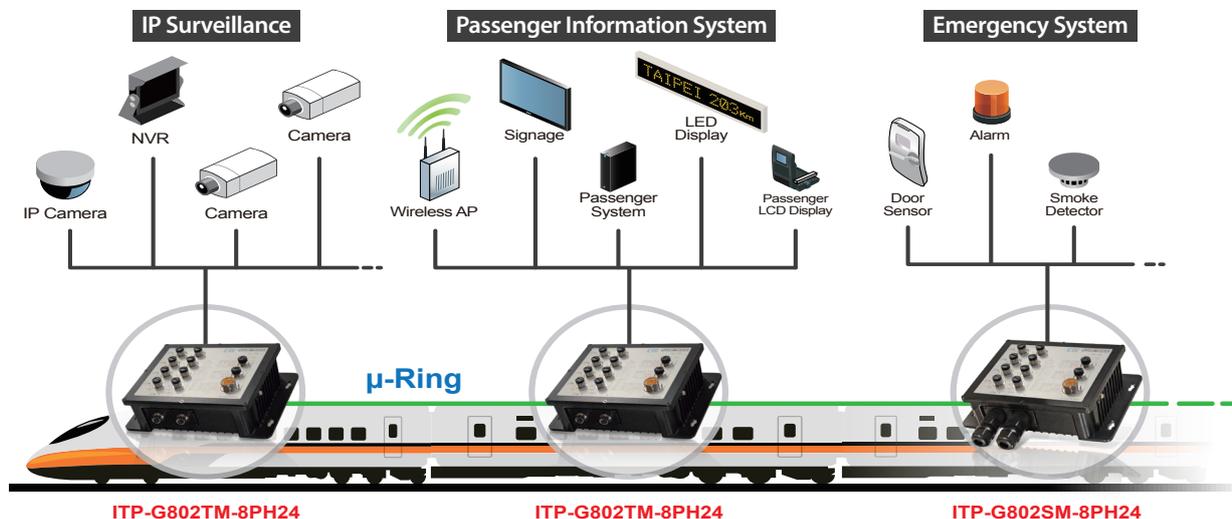
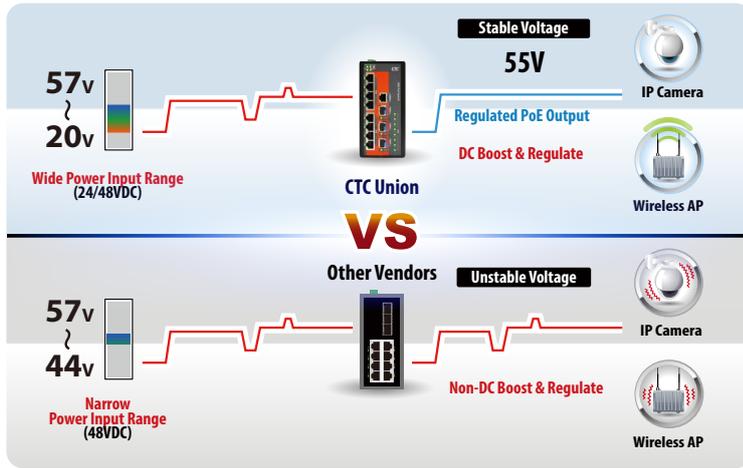


Figure 2 : High Efficiency Boost Technology for PoE



- Regulated PoE output voltage (55VDC) to stabilize PoE device
- Guarantee delivery PoE power distance to 100 meters
- Wide range input power 24/48VDC (20~57VDC)
- Built-in very high efficiency (94~97%) to boost PoE output voltage

Figure 3 : ITP Series for Industrial Automation

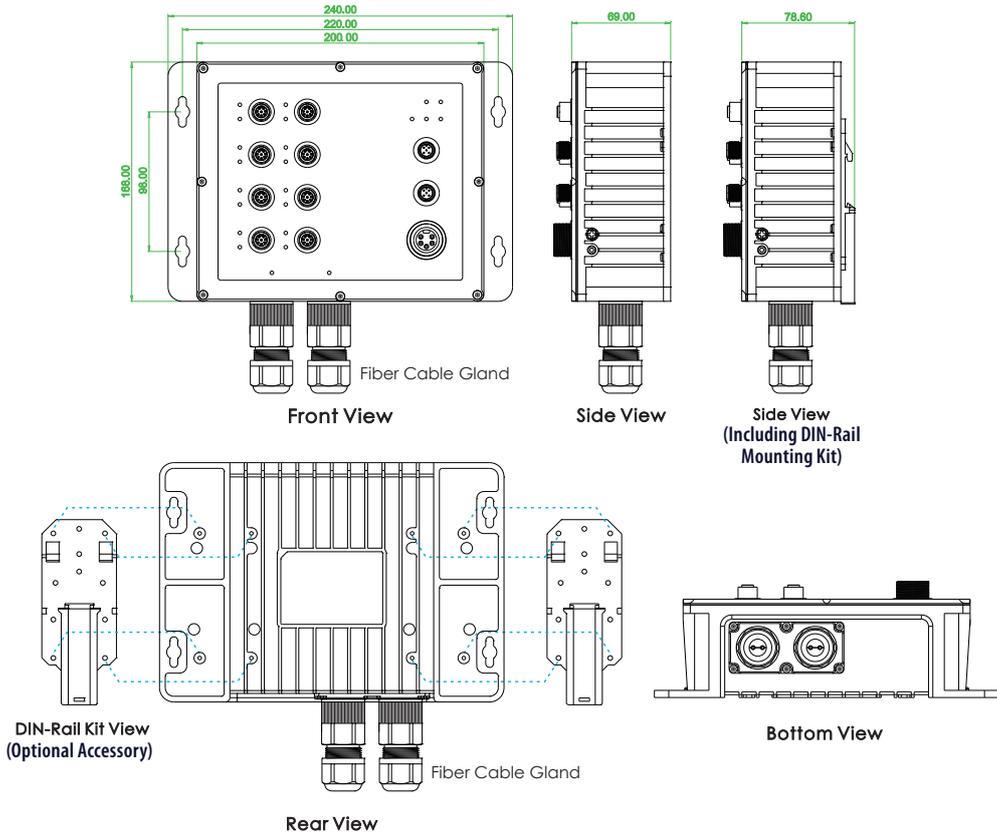


Figure 4 : IP67 Waterproof

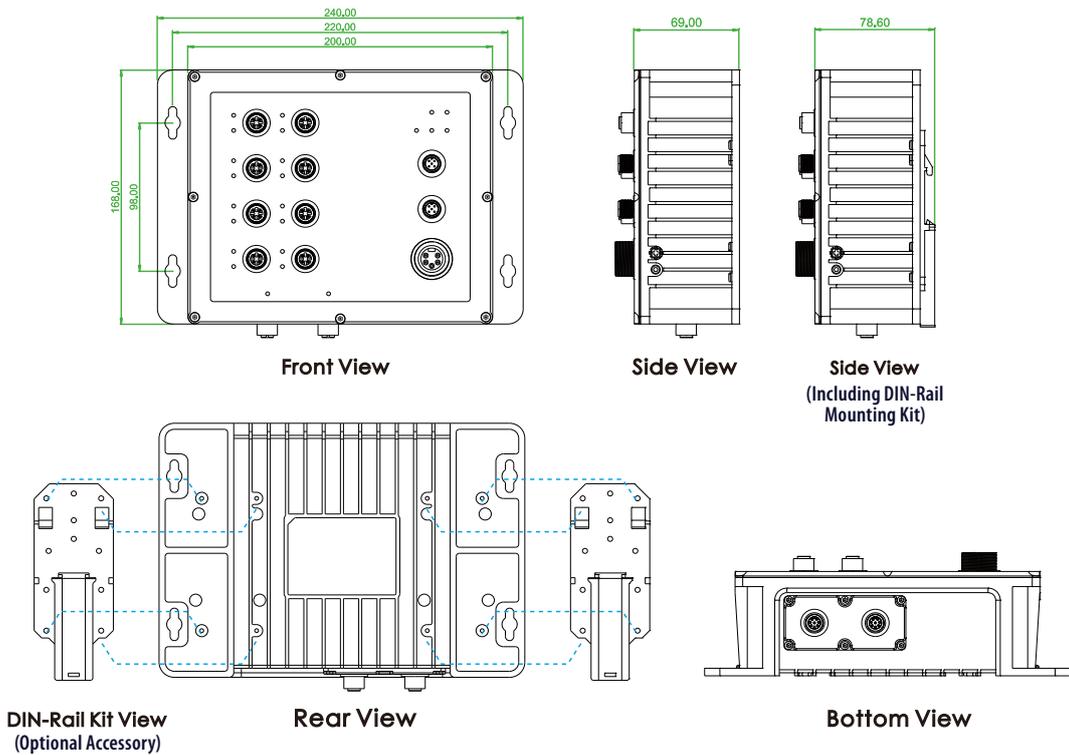


## Dimensions

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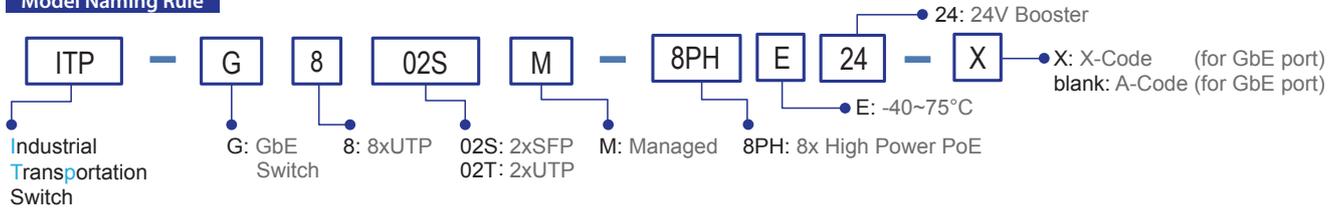
### ▶ ITP-G802TM-8PH24



## Ordering Information

Model Name	Managed	IP67	Total Port	UTP Port M12	Fiber	PoE Port	PoE Total Power Budget	Power Input	Certification				Shock Vibration	Operating Temperature
				10/100/1000 Base-T	100/1000 Base-X	IEEE 802.3at			Redundant	EN50155 EN50121-4	EN60950-1	EN61000-6-2 EN61000-6-4		
ITP-G802TM-8PHE24-X	V	V	10	10 (X-Code)		8	180W	24/48VDC	V	V	V	V	V	-40~75°C
ITP-G802TM-8PHE24	V	V	10	10 (A-Code)		8	180W	24/48VDC	V	V	V	V	V	-40~75°C
ITP-G802SM-8PHE24-X	V	V	10	8 (X-Code)	2 SFP	8	180W	24/48VDC	V	V	V	V	V	-40~75°C
ITP-G802SM-8PHE24	V	V	10	8 (A-Code)	2 SFP	8	180W	24/48VDC	V	V	V	V	V	-40~75°C

### Model Naming Rule



### Package List

- One of the device series
- Protective caps for SFP ports and console, alarm port
- Fiber Cable Gland for SFP port x 2 set (for ITP-G802SM-8PH24)
- Console cable (M12 to DB9)
- CD (Smartconfig, Manual)
- Quick installation guide

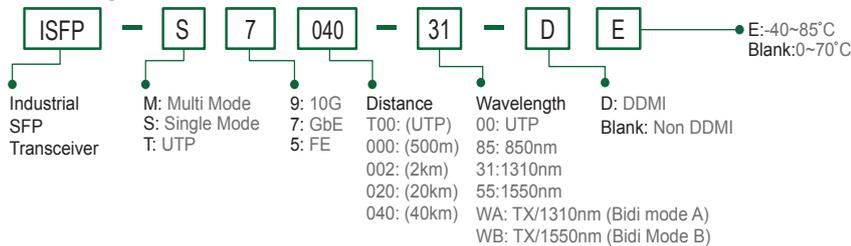
## Optional Accessories

### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the ITP-G802SM-8PH24 for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

<b>ISFP-M7000-85-D(E)</b>	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
<b>ISFP-S7020-31-D(E)</b>	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)
<b>ISFP-M5002-31-D(E)</b>	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
<b>ISFP-S5030-31-D(E)</b>	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

### SFP Naming Rule



### Optional Cable/Connector & Din-Rail Kit

<p><b>P/N: CAB-M12XM8-RJ45</b> M12 X-code Male (8-Pin) to RJ-45, AWG 24, IP67, 1 meter</p>  <p>For GbE UTP (X-code model)</p>	<p><b>P/N: CAB-M12AM8-RJ45</b> M12 A-code Male (8-Pin) to RJ-45, AWG 24, IP67, 1 meter</p>  <p>For GbE UTP (A-code model)</p>	<p><b>P/N: CAB-M12AF5-OPEN</b> M12 A-code Female (5-Pin) to open wire, AWG 22, IP67, 1 meter</p>  <p>For Alarm</p>	<p><b>P/N: CAB-M23F5-OPEN</b> M23 Female (5-Pin) to open wire, (AWG 16), IP67, 1 meter</p>  <p>For Power</p>
<p><b>P/N: M12A-M8</b> M12 A-code Male (8-Pin) connector, IP67</p>  <p>For GbE UTP (A-code model)</p>	<p><b>P/N: M12A-F5</b> M12 A-code Female (5-Pin) connector, IP67</p>  <p>For Alarm</p>	<p><b>P/N: IND-DNK04</b> Din Rail Kit for Industrial, Wide: 52mm</p>  <p>(130 X52mm / 4 Screws) (2pcs/set)</p>	

**5**  
 EN50155 PoE Switch  
 ITP-G802TM-8PH24 & ITP-G802SM-8PH24